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## Climate change and the use of metaphors in public narratives

**Tetiana Myroniuk**

Research and Educational Centre for Foreign Languages, National Academy of Sciences of Ukraine, Kyiv, Ukraine

ORCID 0000-0001-5418-1503

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**Abstract:** This study investigates the role of metaphorical framing in public climate discourse and its influence on public understanding, emotional engagement, and policy orientation. Using the Metaphor Identification Procedure (MIP), the research analyzes a corpus of media articles, institutional reports, and policy documents to identify and classify dominant conceptual metaphors, such as “climate as a threat,” “adaptive response,” “economic investment,” and “health risk”, etc. The findings show that metaphors serve not only as stylistic devices but as powerful cognitive and rhetorical tools that simplify complex environmental processes, evoke emotional responses, and strengthen ideological positions. The most frequent models – “threat/crisis” and “adaptive response” – reflect the tension between urgency and resilience in contemporary climate communication. Less common metaphors, such as “structural weakening” or “geographical shift,” highlight systemic vulnerabilities and may become more prominent in future climate justice discussions.

The paper also explores how different metaphor models resonate emotionally and ideologically, depending on the context and audience. It suggests that certain metaphors may inspire proactive behavior, while others risk causing fear or apathy. By comparing metaphor usage across genres, the study emphasizes the need for customized communication approaches that suit the specific needs and characteristics of different audiences.

The research concludes that carefully chosen, context-specific metaphors can improve the clarity and effectiveness of climate messaging across scientific, political, and media domains. Recommendations are made for responsible metaphor use in policymaking, education, and journalism to support more inclusive discourse on climate adaptation and sustainability.

**Keywords:** climate change, public discourse, metaphor analysis, conceptual metaphor theory, Metaphor Identification Procedure (MIP).

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### 1. Introduction

Metaphorical language is a powerful force in public discourse about climate change, shaping how individuals, communities, and policymakers understand and respond to one of the most complex challenges of our time. Far from being purely rhetorical, metaphors serve as essential cognitive and communicative tools that simplify abstract environmental processes, frame risks, and propose solutions that resonate with cultural values. In climate communication, metaphors such as war, crisis, footprint, and tipping point are frequently used to evoke a sense of urgency, assign responsibility, and guide public action [1, 2].

Researchers have increasingly examined climate-related metaphors for their ideological and emotional influence. According to Nerlich and Hellsten [3], metaphors like *greenhouse effect* and *carbon footprint* do more than communicate scientific concepts—they also carry implicit moral judgments about human responsibility and control. Similarly, Deignan [4] shows that metaphors in climate discourse often reflect broader cultural narratives, such as nature as a victim or technology as a savior. These narrative patterns shape how the public interprets environmental challenges and what kinds of solutions are seen as appropriate or effective.

Studies have also shown that media and advocacy groups often use metaphors in deliberate ways.

Atanasova and Koteyko [5] found that British news stories often use war metaphors to frame climate policy debates, presenting them as battles between opposing sides. This can create a sense of urgency and unity, but it may also cause division or lead people to feel hopeless. In a similar vein, Hel et.al. [6] looked at how the *tipping point* metaphor combines scientific authority with dramatic, even alarming language. On the one hand, this makes it powerful in public messages, but it can also cause misunderstanding.

While metaphors in public climate discourse can help raise awareness and encourage action, they also carry risks. Overreliance on fear-based or militaristic metaphors may lead to disengagement or resistance among certain audiences [7]. Thus, researchers emphasize the need to evaluate not only which metaphors are used, but also how they are perceived in different social and cultural contexts.

As climate change becomes a bigger part of public and political conversations, it's crucial to better understand how metaphors shape these discussions. This can help improve communication, reduce misunderstandings, and support messages that connect with a wider range of people.

## 2. Object and subject of research

The object of this research is metaphorical language as it appears in public climate discourse. This includes metaphorical expressions and conceptual models that are used to describe, explain, and communicate climate change-related phenomena. These metaphors do more than simplify complex information; they shape public understanding, influence media presentation, and inform political narratives [1, 5, 8].

The subject of this study is the functional and cognitive role of dominant metaphor models *Climate as X* within a selected corpus of public-oriented climate texts and reports. These models are analyzed in terms of their frequency, distribution, and rhetorical effect.

A key characteristic of metaphor use in the context of climate discourse is its double purpose: while it facilitates understanding within the scientific community, it also explains the issue for non-experts, often having ideological, emotional, or policy-oriented implications. One major shortcoming of metaphor use is the risk of oversimplification or unintended bias, which can mislead or contribute to political division and hinder constructive dialogue or action.

## 3. Target of research

Given the above-mentioned limitations, the goal of this research is to systematically examine the dominant metaphorical models employed in public climate communication. By doing so, the study seeks to clarify how these metaphors shape understanding, influence public and policy-related perceptions, and either facilitate or hinder effective communication.

To achieve this goal, the following tasks have been set: 1) to review relevant theoretical literature on conceptual metaphor theory and its application in climate-related discourse; 2) to select a representative corpus of public-oriented texts and reports dealing with climate change for metaphor analysis; 3) to identify and classify dominant metaphorical models, such as *Climate as a Threat*, *Adaptive Response*, *Economic Investment*, etc., based on metaphor identification procedure (MIP); 4) to calculate the frequency and distribution of these metaphor models within the selected corpus to determine which models are most prevalent; 5) to analyze selected examples of metaphor use to evaluate their rhetorical, cognitive, and ideological functions in context; 6) to discuss the implications of dominant metaphor choices for public understanding, policy framing, and scientific communication.

## 4. Literature analysis

In recent years, scholars have increasingly recognized the critical role metaphors play in shaping climate discourse, particularly in terms of framing scientific information, influencing public opinion,

and guiding policy narratives.

One of the most influential contributions in this area is by Flusberg, Matlock, and Thibodeau [1], who reviewed common metaphorical frames used in climate related communication, such as *war*, *journey*, and *natural disaster*. Their work emphasized how metaphors influence not only individual understanding but also attitudes toward climate policy. Using psychological experiments, they demonstrated that different metaphors can lead to significantly different interpretations of the same climate data.

Atanasova and Koteyko [5] analyzed climate change metaphors in UK press discourse using corpus-assisted discourse analysis. They identified repeated metaphorical patterns that present climate change as *a battle*, *a disease*, or *a market phenomenon*, each carrying distinct ideological and political meanings. Their work shows how metaphor use in the media can reflect and support certain policy views, even subtly.

Nerlich and Jaspal [8] offered a sociolinguistic and psychological perspective on climate change communication, focusing on the metaphor of the *tipping point*. While based on scientific ideas, this metaphor often comes with dramatic or alarmist tones that may create fear or feelings of helplessness in the public. Their analysis called for greater awareness of metaphor choice in public communication.

Nerlich and Hellsten [3] examined two major metaphors: *the greenhouse* and *the footprint*. They showed that these metaphors shape how people think about the human–environment relationship. The *greenhouse* metaphor focuses on trapping heat, while the *footprint* metaphor stresses individual responsibility and lasting impact. According to the authors, these metaphors can help explain climate issues, but they can also oversimplify the problem, depending on the audience and the purpose of the message.

Burgers, Konijn, and Steen [9] proposed a methodological framework for analyzing metaphor in multimodal climate communication, combining linguistic, visual, and narrative dimensions. Their model allows for a more comprehensive understanding of how metaphors work across various platforms and genres, including social media, infographics, and video content.

Using a corpus linguistics approach, Fløttum [10] compared how metaphors appear in political and scientific climate texts. She used methods like semantic tagging and keyness analysis to find differences in how metaphors such as *pathways*, *turning points*, and *climate responsibility* are used. Her study showed that these metaphors serve different purposes depending on whether the text targets scientists, policymakers, or the general public.

Deignan [4] emphasized the multifunctionality of climate metaphors in both scientific and public texts. She pointed out that metaphors not only help explain complex ideas, but also influence how messages are perceived and understood. Her work shows that the effect of a metaphor depends on the audience and the context in which it appears, and that familiar, culturally shared metaphors are often more persuasive.

A study of Swedish farm magazines by Dunér and Björk [11] illustrates how metaphor use varies across social sectors. They find that metaphors like *climate as a game of chance* or *battle* reflect the agricultural sector's perception of risk and control. Their findings demonstrate the importance of domain-specific metaphor analysis and support the idea that metaphor functions as a cultural and strategic framing tool.

Finally, Hel, Hellsten, and Steen [6] analyze the increasingly popular *tipping point* metaphor. They explain that while it is rooted in scientific modeling, it also carries dramatic and sometimes alarming tones in media use. As a result, the metaphor is effective but also ambiguous – it can clarify scientific ideas or confuse the public, depending on how it is used.

Together, these studies reveal key trends in metaphor research: the integration of Conceptual Metaphor Theory (CMT), critical discourse analysis (CDA), and corpus linguistics; the use of automated metaphor identification tools; and a growing interest in multimodal and cross-cultural metaphor studies. These methods allow researchers to study not only which metaphors are used, but also how they affect emotions, meaning, and political debate.

The present research moves beyond metaphor identification to explore how specific metaphor

frames operate in different genres of public communication – such as media reporting, policy documents, and advocacy materials. As climate change becomes more central to public discussion, the metaphors used to talk about it play a powerful role in shaping how people understand the issue, who they think is responsible, and which actions seem possible or urgent. By analyzing these metaphors in context, this study provides insights that can help communicators, educators, and policymakers develop more inclusive, accurate, and effective climate messages.

## 5. Research methods

This study applies a qualitative and quantitative mixed-methods approach to identify, classify, and analyze metaphorical expressions in public climate discourse. The methodological foundation is based on the Metaphor Identification Procedure (MIP), a systematic tool developed by the Pragglejaz Group [12] for detecting metaphorical language in spoken or written texts. MIP is widely recognized in cognitive linguistics and discourse analysis for its transparency, replicability, and context-sensitive framework.

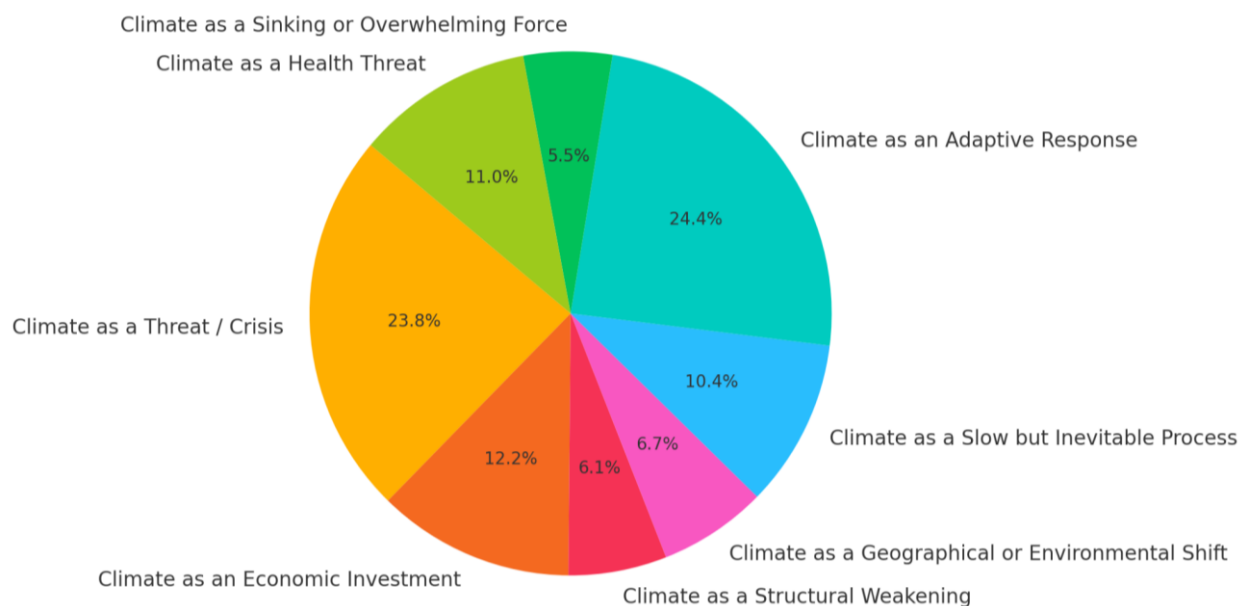
A diverse and representative corpus was compiled, consisting of public-facing texts related to climate change. The selection includes journalistic articles from widely read news outlets (The Guardian, AP News, Axios etc.), communications from scientific and institutional bodies (e.g., NOAA, WHO), and policy documents from international organizations such as the European Commission, the International Energy Agency (IEA), and the Inter-American Development Bank (IDB). These texts were chosen to reflect a broad spectrum of public discourse, including media reporting, policy communication, and advocacy messaging, in order to capture a wide range of rhetorical strategies and metaphor use.

To systematically detect metaphorical expressions, the study applied the Metaphor Identification Procedure (MIP) [12]. This involved several key steps: 1) text familiarization (each text was read thoroughly to establish its thematic focus, communicative intent, and tone. Contextual understanding was crucial for interpreting potential metaphor use accurately); 2) lexical unit segmentation (texts were segmented into lexical units, usually consisting of single words or fixed expressions, for close semantic analysis); 3) literal meaning determination (for each lexical unit, its most basic, conventional meaning was identified—typically grounded in physical experience or everyday use); 4) contextual meaning assessment (the meaning of each unit was then assessed in context. If the contextual meaning differed from the literal meaning but remained coherent, the unit was marked as metaphorical); 5) metaphor annotation (identified metaphors were documented, and their source (literal) and target (abstract) domains were recorded).

After metaphor identification, cases were grouped into broader conceptual categories following the theory of conceptual metaphor proposed by Lakoff and Johnson [13]. Metaphors were analyzed both quantitatively, by measuring their frequency and distribution across texts, and qualitatively, through detailed interpretation of their rhetorical, cognitive, and ideological functions. Particular attention was paid to how metaphors shaped perceptions of urgency, blame, and proposed solutions, as well as their emotional and persuasive effects.

## 6. Research results

This study identified and analyzed 164 metaphorical expressions related to climate change within selected public-oriented texts, including journalistic articles, institutional publications, and policy communications. Using the Metaphor Identification Procedure (MIP), each metaphor was classified into one of eight dominant conceptual models. The results of this classification are presented below, along with interpretations of their communicative and rhetorical functions. The distribution of metaphor models is summarized in the pie chart below (Figure 1).



**Figure 1.** Distribution of climate metaphor models.

This distribution shows a clear emphasis on two dominant metaphor models: *Climate as an Adaptive Response* (24.4%) and *Climate as a Threat / Crisis* (23.8%). These two models reflect a fundamental duality in contemporary climate discourse: the balance between proactive adaptation strategies and urgent, risk-centered narratives. Mid-tier metaphor models – such as *Climate as an Economic Investment* (12.2%), *a Health Threat* (11.0%), or *a Slow but Inevitable Process* (10.4%) – reflect growing public and policy attention to the financial, health, and systemic aspects of climate change. Less common models like *Climate as a Geographical Shift* (6.7%), *Structural Weakening* (6.1%), or *Overwhelming Force* (5.5%) appear less frequently, indicating they are either more specialized or currently underused in public discourse. These patterns offer insight into how climate change is being conceptually framed to shape awareness, motivation, and policy action.

Let us have a closer look at dominant models first and then at less frequent ones.

**Climate as a Threat / Crisis** was one of the most frequently used metaphors in the selected corpus. It conveys a sense of urgency and approaching danger, aiming to mobilize action through fear and moral responsibility. It is often used in media headlines and activist discourse to emphasize the severity of climate impacts. However, overuse may result in “crisis fatigue” or disengagement.

e.g. “Climate change presents a significant threat to global health, exacerbating vulnerabilities in health systems and widening health inequities.” [14]

The term “*threat*” maps the concept of physical danger onto climate change, presenting it as an urgent, hostile force. “*Vulnerabilities*” personifies health systems as defenseless or fragile bodies, while “*widening health inequities*” uses spatial metaphor to make growing social injustice more real.

Cognitively, these metaphors make the abstract nature of climate change more specific and immediate, activating survival instincts and framing inequality as a visible gap. Rhetorically, they work to persuade the public and policymakers by invoking both urgency and moral responsibility. Ideologically, the metaphors position climate change as not only an environmental crisis but also a matter of social justice, emphasizing the ethical imperative to act.

**Climate as an Adaptive Response** reflects a more solution-oriented approach, framing climate change as a challenge that societies can adapt to through innovation, resilience, and planning. It appeals to hope and action rather than fear, and is increasingly used in policy and development contexts.

e.g. “The strategy refers to supporting the region's need for ‘low-carbon and climate-resilient development,’ portraying this approach as a specific path or route to be followed.” [15]

The metaphorical language in the phrase “a path to be followed” presents climate adaptation as

a structured, goal-oriented journey, making complex policy strategies more real. It encourages readers to see “*resilience development*” as a practical and achievable process, supported by planning and cooperation.

Cognitively and rhetorically, this metaphor reduces feelings of uncertainty by suggesting that institutions know the direction forward. Ideologically, it reflects a technocratic worldview, highlighting the role of leadership, global climate finance, and coordinated policy as tools for managing climate challenges.

**Climate as an Economic Investment** highlights the potential benefits of climate action, particularly in terms of financial returns, job creation, and technological progress. It is especially effective in political and corporate messaging, aligning environmental goals with economic growth.

e.g. “*The commission estimates that an average household that ‘fully electrifies’ could cut their annual energy spending by 70%, or \$3,500 – once they have dealt with the upfront costs.*” [16]

In this example, metaphors like “*electrifies*”, “*cut spending*”, and “*upfront costs*” frame climate action as a financially strategic investment. The source domains of physical activation, and monetary exchange are mapped onto target domains like energy transition, saving money, and long-term returns, simplifying complex environmental decisions into familiar economic terms.

Cognitively, the metaphor helps audiences conceptualize climate action as a rational and progressive upgrade. Rhetorically, it appeals to middle-income households by emphasizing measurable savings and presenting electrification as a modern, responsible choice. Ideologically, it reflects a market-oriented perspective, promoting the idea that addressing climate change is not just ethical but economically advantageous, supporting the notion that green policy and financial gain can go hand in hand.

**Climate as a Health Threat** connects climate change with personal well-being, emphasizing the health risks posed by extreme heat, air pollution, and disease. This frame has become more significant since the pandemic and draws public attention to climate change on an individual level. effectively engages the public with climate change on a personal level.

e.g. “*It depicts a planet with a high – and increasing – fever due to record high levels of human-caused greenhouse gases.*” [17]

The metaphorical usage of “*fever*” and “*planet with a high fever*” equates climate change with a medical condition, framing it as a global illness. This personifies the Earth, allowing people to relate to environmental data through the familiar experience of physical sickness.

Cognitively, it makes abstract climate processes more understandable by linking them to bodily symptoms. Rhetorically, it engages empathy and emphasizes urgency without relying on scientific jargon. Ideologically, it shifts the climate conversation into the domain of public health, implying that climate inaction is as irresponsible as ignoring a serious medical condition. The metaphor model effectively supports the model of climate as a health threat, emphasizing the need for immediate and coordinated response.

**Climate as a Slow but Inevitable Process** presents climate change as a long-term, gradually unfolding phenomenon. While scientifically accurate, it may lessen the sense of urgency if not accompanied by more immediate or visible consequences.

e.g. “*Warming waters can lead to coral bleaching and stronger hurricanes can destroy reefs.*” [18]

The metaphorical language—such as “*warming waters*” and “*stronger hurricanes*” – presents climate change as a gradual but unstoppable force. It emphasizes nature’s slow, cumulative response rather than sudden disaster.

Cognitively, this framing helps audiences grasp the idea that minor shifts, like temperature increase, can trigger large-scale ecological changes over time. Rhetorically, it avoids alarmist tones and instead conveys urgency through gradual progression. Ideologically, it suggests that meaningful action must occur before damage becomes visible, supporting the need for taking preventative measures and sustainable environmental care.

**Climate as a Geographical or Environmental Shift** underlines the spatial and ecological

transformations caused by climate change, such as migration, desertification, and biodiversity loss. It often appears in discussions of climate justice and international policy.

e.g. *“There were never any climate havens: floods in the Midwest, hurricanes in Appalachia.”* [19]

The metaphor “*climate havens*” portrays regions once believed to be safe from extreme weather as vulnerable, using the concept of a “haven” to highlight environmental shifting. The reference to “*floods in the Midwest*” and “*hurricanes in Appalachia*” supports this by illustrating unexpected climate events in previously stable areas.

Cognitively, this metaphor model helps readers understand that climate change affects a wide range of locations and is difficult to predict. Rhetorically, it uses familiar regional imagery to question existing beliefs and provoke reconsidering what areas are truly safe. Ideologically, it promotes a broader and fairer view at climate risk, arguing against the notion that some regions are exempt and in favor of widespread preparation and adaptation.

**Climate as a Structural Weakening** portrays climate change as a force that gradually threatens ecological, social, or political systems. Though less common, it supports deeper critiques of institutional fragility and inequality.

e.g. *“Coastal infrastructure is at risk from sea level rise. Nearly 40% of the United States population lives in coastal counties, meaning millions of people will be impacted by related risks.”* [18]

The metaphors “*at risk*” and “*impacted*” personify infrastructure as vulnerable and under threat, while “*sea level rise*” is depicted as a slow but persistent force weakening essential systems such as cities and transport networks.

Cognitively, these metaphors help readers understand climate change as a real degradation of familiar systems, converting complex environmental processes into material risks of failure or collapse. Rhetorically, the imagery evokes a sense of danger and urgency without exaggeration, appealing to concerns about safety and economic security. Ideologically, the metaphors frame climate change as a direct threat to societal stability, supporting calls for investment in resilient infrastructure and policy action to prevent systemic breakdown.

**Climate as a Sinking or Overwhelming Force** is typically used in emotional or visual storytelling, portraying climate change as an unstoppable or catastrophic event. While it effectively highlights the danger, it may also lead to feelings of helplessness and defeat.

e.g. *“In December 2022, the “Blue Blizzard”, called a “generational storm” by the Minnesota department of natural resources, dumped up to two and half feet of exceptionally wet and heavy snow, formed in warm temperatures.”* [19]

The expression “*generational storm*” metaphorically frames the weather event as an overwhelming historical force, while the verb “*dumped*” personifies the storm as an aggressive, uncontrolled force. Together with the unusual formation in warm temperatures, these elements highlight climate instability and confusion.

Cognitively, the metaphor helps audiences grasp climate change through the image of sudden, extreme disruption. Rhetorically, it emphasizes the scale of the event without being too alarmist. Ideologically, it highlights the urgency of adaptation by showing how climate change is already transforming familiar environments through unpredictable and extreme events.

## 7. Prospects for further research development

The metaphorical framing of climate change in public discourse presents significant potential for further investigation. As this study has shown, metaphors not only help communicate complex climate issues but also shape public understanding, policy support, and emotional engagement. Future research can build on these findings by expanding the scope of analysis across languages, cultures, and media platforms, allowing for comparative studies that reveal how different societies conceptualize and respond to climate change.

In the long term, integrating metaphor analysis into climate communication strategies can increase public engagement, reduce misinterpretation, and stimulate more constructive, action-oriented dialogue.

## 8. Conclusions

The present study has explored the role of dominant metaphorical models in public climate communication and revealed how these metaphors shape perception, guide policy narratives, and influence public engagement. Through the application of the Metaphor Identification Procedure (MIP), the study systematically analyzed a representative corpus of climate-related texts and identified recurring metaphorical patterns – such as climate as a threat, investment, health risk, or adaptive challenge, etc.

Findings show that these metaphors are not mere stylistic devices; rather, they function as cognitive and rhetorical tools that help audiences understand complex environmental processes and address the emotional responses and beliefs associated with climate change. The use of "crisis" metaphors, for example, effectively emphasizes urgency but can also lead to fear or fatigue. In contrast, "adaptive response" and "economic investment" frames portray climate action as both practical and beneficial, encouraging future-oriented thinking and more optimistic policy perspectives. Less commonly used models, like "climate as structural weakening" or "environmental shift", shed light on underexplored vulnerabilities and could become increasingly important as global conversations on climate justice and migration continue to evolve.

The research confirms that metaphors are powerful agents of meaning-making. They do not merely describe climate change – they shape how it is interpreted, who is seen as responsible, and which responses are considered practical. Importantly, this study underlines the need for climate communication strategies that are not only scientifically accurate but also emotionally resonant and socially inclusive.

To sum up, this research demonstrates that thoughtful and contextually appropriate metaphor use can make climate communication clearer, more engaging, and more effective in promoting global cooperation. Future work should use these insights to improve how metaphors are applied in policymaking, education, and media, helping societies respond more effectively and collectively to the challenges of climate change.

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